

AS Doug Holsten

DRILLING AND SAMPLING, RHONE-POULENC FACILITY, SCOPE OF WORK

Introduction

This Scope of Work describes drilling and sampling of soil and groundwater to be performed at the Rhone-Poulenc Facility located at 9229 East Marginal Way South in Tukwila Washington.

The project involves two tasks: (1) shallow drilling and soil sampling and (2) a HydroPunch groundwater quality investigation. These two tasks are addressed separately in this scope of work for the sake of clarity.

Drilling for soil sampling is tentatively scheduled to begin the week of January 17, 1994. The HydroPunch drilling and sampling is tentatively scheduled to begin immediately following the soil sampling task.

Task 1 - Shallow Drilling and Soil Sampling

Shallow soil borings (to 10 feet deep) will be drilled at 28 locations. Subsurface conditions are expected to consist of fill and native soils consisting of gravel- to clay-size material. Some of these locations are paved with concrete or asphalt and will need to be cored or cut prior to drilling.

Drilling Rig and Sampler Requirements

Drilling shall be performed using a truck-mounted hollow stem auger drilling rig equipped with 6-inch nominal inside-diameter (ID) augers. Soil samples shall be collected using 3-inch outside-diameter (OD) split-barrel samplers equipped with sample catchers. The Subcontractor shall provide a minimum of three (3) split-barrel samplers. The split-barrel sampler shall be driven using a 300-pound hammer falling 30-inches.

Concrete and Asphalt Cutting

Many of the sampling locations are overlain by either concrete which may be 6- to 8-inches thick, or asphalt. At these locations the cover material must either be cut or cored prior to drilling. There are approximately 23 locations where asphalt must be cut or cored and approximately 33 locations where concrete must be cut or cored. Not all of the cut or cored locations will be drilled for sample collection. Some of these locations not drilled will be sampled with hand tools by CH2M HILL; no assistance from the Subcontractor will be necessary for sampling at these sites.

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Cut asphalt and concrete shall be stockpiled at a central location on site. The Subcontractor shall transport all asphalt and concrete debris generated to the location specified by the CH2M HILL hydrogeologist.

Equipment Decontamination

All augers, drill bits, split-barrel samplers and other downhole equipment shall be steam cleaned to the satisfaction of the CH2M HILL hydrogeologist prior to use and between borings.

The Subcontractor shall construct or otherwise provide a watertight decontamination area. All steam cleaning water shall be contained by the Subcontractor and pumped to an onsite storage tank which will be provided by CH2M HILL.

Any decontamination pad constructed by the Subcontractor may be left in place until the end of the HydroPunch investigation (discussed later). At the conclusion of the HydroPunch investigation the decontamination pad shall be removed from the site and shall remain the property of the Subcontractor.

Drilling Locations

A total of 28 sampling locations will require the use of a drilling rig for soil sample collection. At each of these 28 locations the soil borings shall be drilled to a depth of 10.0 feet below ground surface (BGS). Drilling locations will be marked and cleared for underground and overhead utilities prior to drilling.

Sampling Intervals

Soil samples shall be collected continuously from zero to 10.0 feet BGS (five samples per boring) at each of the 28 drilling locations.

Disposal of Drill Cuttings

Investigation-derived drill cuttings shall be contained in drums or other containers which will be provided by CH2M HILL.

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Personal Protective Equipment

The Subcontractor is responsible for the health and safety of their personnel. It is anticipated that the drilling and sampling work will be performed in Level D personal protective gear. The driller(s) should be prepared to upgrade to Level C personal protective gear.

Backfilling Boreholes

No wells will be installed in the boreholes. Boreholes shall be backfilled with bentonite grout or hydrated bentonite chips to within approximately 2 feet BGS. The remaining borehole shall be finished with either a concrete plug or a concrete plug covered with asphalt (consistent with the surrounding pavement type). Boreholes abandoned in unpaved areas shall be completed at the surface with a concrete plug.

Task 2 - HydroPunch Investigations

The HydroPunch sampler will be used to collect groundwater samples from the borings within soil investigation area A4. The intent of using the HydroPunch is to delineate a Light Non-Aqueous Phase Liquid (LNAPL) layer. There are 13 sampling locations arranged in a grid with 50-foot spacing within the soil investigation area. This sampling grid may be expanded (additional boreholes) based on the results of the HydroPunch investigation. Soil samples will be collected concurrently with the HydroPunch investigation using a split-barrel sampler.

Drilling Rig and Sampler Requirements

Drilling shall be performed using a truck-mounted hollow stem drilling rig equipped with 6-inch nominal inside-diameter (ID) augers. Soil samples shall be collected using a 3-inch outside-diameter (OD) split-barrel samplers equipped with sample catchers. The split-barrel sampler shall be driven using a 300-pound hammer falling 30-inches.

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A HydroPunch II shall be used to collect groundwater samples in soil investigation area A4. The HydroPunch II shall be provided and operated by the Subcontractor. Specifically, the Subcontractor shall provide all expendables and equipment required to operate the HydroPunch II in both the groundwater and hydrocarbon sampling modes. This shall include but not be limited to:

- Expendable drive points
- Replacement O-rings as needed
- Other maintenance equipment and replacement parts as needed.

CH2M HILL will provide the stainless steel screen kits, PVC screen kits, discharge kits, and hydrocarbon-mode bailers.

Concrete and Asphalt Cutting

All 13 of the HydroPunch sampling locations are overlain by asphalt. At these locations the cover material will need to be either be cut or cored prior to drilling. Should the HydroPunch sampling grid be extended additional asphalt or concrete cuts may be required.

Cut asphalt and concrete shall be stockpiled at a central location on site. The drilling subcontractor shall transport all asphalt and concrete debris generated to the location specified by the CH2M HILL hydrogeologist.

Equipment Decontamination

All augers, drill bits, split-barrel samplers, HydroPunch II sampler parts, and other downhole equipment shall be steam cleaned to the satisfaction of the CH2M HILL hydrogeologist prior to use and between borings.

All steam cleaning water shall be contained and pumped to an onsite storage tank which will be provided by CH2M HILL. At the conclusion of the HydroPunch investigation the decontamination pad shall be removed from the site and shall remain the property of the drilling subcontractor.

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Drilling Locations

The 13 sampling locations will require the use of a drilling rig for soil sample collection and HydroPunch II groundwater sampling. Drilling locations will be marked and cleared for underground and overhead utilities prior to drilling.

LNAPL and Groundwater Sampling

The groundwater table at the site is approximately 10 feet BGS. LNAPL and groundwater samples will be collected at and below this depth with the HydroPunch II sampling device.

The Subcontractor shall operate the HydroPunch in the hydrocarbon sampling mode at the groundwater table. This will require the HydroPunch to be driven approximately 4 feet beyond the auger bit. The HydroPunch will be subsequently pulled back approximately 48 inches to expose the disposable screen. CH2M HILL will then remove a sample of the LNAPL (or groundwater) using the HydroPunch hydrocarbon bailer (supplied by CH2M HILL).

After collection of a LNAPL sample, drilling will continue and groundwater samples will be collected at multiple depths using the HydroPunch in the groundwater sampling mode. This will require the HydroPunch to be driven approximately 24 inches beyond the auger bit. After a groundwater sample has entered the HydroPunch, the tool will be recovered by the Subcontractor. CH2M HILL personnel will containerize the groundwater sample.

It is anticipated that 9 of the 13 boreholes will be drilled to approximately 15 feet BGS; the other 4 boreholes will be drilled to depths of up to 70 feet. Additional boreholes and HydroPunch samples may be added to the investigation at the discretion of CH2M HILL. It is anticipated that approximately 25 to 41 groundwater samples will be collected (assuming that additional sampling points are not added to the grid).

Soil Sampling

Soil samples shall be collected continuously from zero to 9.0 feet BGS (five samples per boring) at each of the 13 drilling locations.

At least four of the 13 boreholes will be drilled deeper than 10 feet BGS. Soil samples from depths greater than 10 feet BGS shall be collected every five feet and at all changes in lithology. It is anticipated that these four (or more) boreholes will be drilled to

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approximately ⁷⁰~~65~~ feet BGS.

Approximately 109 soil samples will be collected during the HydroPunch investigation (assuming that additional sampling points are not added to the grid).

Disposal of Drill Cuttings

Investigation-derived drill cuttings shall be contained in 55-gallon drums or other container(s) provided by CH2M HILL.

Personal Protective Equipment

The Subcontractor is responsible for the health and safety of their personnel. It is anticipated that the drilling and sampling work will be performed in Level D personal protective gear. The driller(s) should be prepared to upgrade to Level C personal protective gear.

Backfilling Boreholes

No wells will be installed in the boreholes. Shallow (up to 15 feet BGS) boreholes shall be backfilled with bentonite grout or hydrated bentonite chips to within approximately 2 feet BGS. The remaining borehole shall be finished with either a concrete plug or a concrete plug covered with asphalt (consistent with the surrounding pavement type). Boreholes abandoned in unpaved areas shall be completed at the surface with a concrete plug as cover material. Boreholes drilled deeper than 15 feet BGS shall be backfilled with cement/bentonite grout (5% bentonite). The grout shall be installed by pumping from the bottom to two feet BGS using a tremie pipe. The remaining two feet shall be completed with a concrete plug covered by asphalt.

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Cost Estimate

Please use or refer to Table 1 below for bidding purposes. Estimated quantities, footage, etc. are supplied for items in the table.

Table 1: Bid for Soil Borings and HydroPunch				
Bid Item	Unit	Estimated Units	Cost Per Unit	Total Estimated Cost
Mobilization/Demobilization	lump sum	1		
Concrete cutting/coring	each	33		
Asphalt cutting/coring	each	36		
6-inch ID auger shallow drilling with soil sampling	hour	70		
6-inch ID auger drilling with HydroPunch sampling	hour	80		
Bentonite chips	sack	220		
Bentonite powder	sack	2		
Cement	sack	90		
Concrete	sack	45		
Asphalt patch	sack	15		
Decontamination pad construction/removal	lump sum	1		
Decontamination	hour	22		
Labor for backfilling borings	hour	30		
Standby	hour	15		
Level D health and safety expendables	person (day)	28		
O-ring kits (10 sets)	each	4		
HydroPunch II drive points	each	13		
Additional items not listed				